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# Costs and Profits of Sheep on Irrigated Farms

By

E. L. Potter, Animal Husbandman,

and

Robert Withycombe, Superintendent Eastern Oregon Branch Experiment Station

CORVALLIS, OREGON

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## SUMMARY

1. The hay needed for winter will be approximately 25 tons.

2. The irrigated pasture needed for summer will be 20 acres.

3. The labor for the entire year will average 350 hours.

4. The ewes will be first bred when 1½ years of age, and will be discarded at an average age of 7½ years.

5. The average annual death loss will be around 6 percent.

6. It will be necessary to cull out an average of 14 head of old ewes each year.

7. To make up for the death loss and for the old ewes sold, 20 new ewes will be needed each year.

8. The wool clip for mutton bred ewes will average about 7 pounds and for fine bred ewes 8 to 9 pounds.

9. There should be an average of 110 head of lambs at lambing time.

10. At marketing time there should be 100 head and they should be fat and weigh around 80 pounds.

11. With lambs at 10c and wool at 40c, a farm ewe should pay $8.00 a ton for hay, $3.00 a year for pasture, 40c an hour for labor, 8% on investment, and an additional clear profit of 72c.

# Costs and Profits of Sheep on Irrigated Farms

By

E. L. Potter and Robert Withycombe

Is there any profit in sheep on an irrigated farm? This is the question to be answered in this circular. At the outset, however, we must say that it can not be answered with a final "Yes" or "No," for the answer is never the same in any two cases. The prospective sheepman who expects some one else to tell him offhand exactly how much money can be made in sheep farming will be disappointed. On the other hand, the man who is willing to give the matter a little study and who will take the small amount of time necessary to go through this brief circular, will be able to answer his question with at least as much accuracy as it is possible to answer any question which, as is true of the sheep business, is so largely dependent on the uncertainties of weather, crops, and markets. It must be recognized, however, that the sheep business on the irrigated farms of Eastern Oregon is new and still in the experimental stage. This circular is based upon the best information available at the present time, but we must admit frankly that there is still much to be learned.

The financial side of sheep raising may be considered under three heads: maintenance costs, interest and depreciation on investment, and income.

## MAINTENANCE COSTS

The logical beginning of the sheepman's financial year is September or thereabouts. Lambs are sold, or ready to sell, by this time; cull ewes discarded, rams purchased, and breeding operations for the next year begun. Most of the sales and trades in stock sheep are at this season.

**Winter feed for breeding ewes.** Winter feed is one of the heaviest items of expense of the farm flock in the irrigated sections of Eastern Oregon, since very little winter grazing is available, and it is necessary to feed hay for about four months. The standard allowance of good alfalfa hay for ewes weighing 100 to 140 pounds such as will be found in the average farm flock, will be 4 pounds a day. On this amount of feed they will make a little gain, about enough to cover the growth of wool and of the embryo lamb and to offset the necessary loss of weight at lambing time. Extra large, well bred ewes of the Hampshire or other large breeds weighing 160 to 180 pounds will require a little more hay, usually around 4.25 pounds. The grade Hampshire ewes at the Union Experiment Station fed on alfalfa hay alone for seven winters received 4.3 pounds of alfalfa per day. Of this amount they wasted or refused .3 pound, thus making the actual consumption even 4 pounds. On this feed the ewes gained .14 pound a day. The average weight of these ewes was 157 pounds. The work at Union began with rather common grade range ewes weighing 122 pounds. The ewes were then gradually graded up by the use of Hampshire bucks and the elimination of the old-

er ewes until at the beginning of the last two winters the average weight of the flock was 182 pounds. As the ewes increased in size, the feed requirement increased from less than 4 pounds to 4.5 pounds.

The Union Station has tried various other feeds than alfalfa hay, but has so far been unable to find anything better or cheaper. Wild hay and peas and bald barley hay have not been equal to alfalfa. Silage and alfalfa, however, has been a good ration, but expensive. A large number of experiments have been conducted comparing silage and alfalfa with alfalfa alone. Most of this work has been with peas and bald barley silage, although some with corn silage and some with sunflower silage. In most cases one pound of silage was fed in connection with what alfalfa hay the ewes would eat. The addition of one pound of silage to the ration has reduced the alfalfa consumed by approximately ¼ pound, or in other words, one ton of silage has saved one-fourth ton of alfalfa; but, of course, one ton of silage costs much more than ¼ ton of hay. The only advantage of the silage would be in case the ewes did better, but on the basis of the six years' work done, it can be safely said that ewes fed one pound of silage in addition to alfalfa do not make any better gains or keep in any better condition than where fed alfalfa alone. They do not produce any more lambs and the lambs are no stronger or more vigorous at birth. The fact is, the percentage of lambs from the silage-fed ewes has not been as high as from the alfalfa-fed ewes. Many sheepmen maintain that ewes fed silage during and after lambing milk better and make their lambs gain better. Tests at Union give some indication that this may be true, but it will take two or three years more to prove this point one way or the other. In any case, the silage adds to the expense, and the improvement in the lambs will have to be quite noticeable in order to justify its use.

Comparisons of peas and barley, sunflower, and corn silage have not shown any marked differences, except of course that a well-cured silage with a large amount of grain is much superior to a watery, poorly cured silage with little grain, regardless of the species of plant from which it is made.

In another test, one lot was fed 3 pounds of silage, another lot 2 pounds, and a third lot 1 pound. All lots had all the alfalfa they would eat. The use of the larger amounts of silage added to the expense without any apparent advantage. The larger amounts of silage saved very little hay, and the ewes did not do any better.

Our conclusions are that feeding silage before lambing is an added expense with no advantage. The value of silage fed during and after lambing has not yet been fully determined.

The use of grain for wintering ewes has been found unnecessary, as the ewes have kept in just as high condition as was permissible without grain, provided the ewes were healthy and had good teeth.

The man who has only alfalfa hay for wintering may rest assured that he has an absolutely high class feed and that if the ewes are given all the alfalfa they will eat, but do not do well and produce a good lamb crop, the fault is somewhere else than in the feed. This is demonstrated by the fact that at Union during seven years work, for each 100 ewes bred in the fall and wintered on alfalfa alone, there were 142 lambs at marking time the following spring. If we figured the lambing percentage on the basis of the number of ewes lambing in the spring, as do many

sheepmen, the percentage would be 151. This is a percentage of course which the average sheepman will probably be unable to duplicate, and the Union Station may not duplicate it; but it demonstrated that breeding ewes will thrive and produce large lamb crops when wintered on straight alfalfa hay. This statement applies, however, only to ewes with good teeth. Old ewes with broken teeth will need about 1 pound of grain a day in addition to hay.

The length of the winter feeding period will average about four months, although some years longer and some years shorter. This means that the total amount of hay required will be approximately 500 pounds. (Four pounds a day for 125 days.)

**Winter feed for ewe lambs.** Ewe lambs that are held over the winter to be put into the breeding herd the following fall may be fed in practically the same way as breeding ewes; that is, they should be given all the alfalfa hay they will eat. On account of their smaller size, however, they will not consume as much feed as a full grown ewe. Hence, instead of 500 pounds as a total allowance, 400 pounds will be sufficient.

**Pasture for breeding ewes.** The actual amount of grass consumed by a ewe and her lamb is fairly constant, but our irrigated pastures are extremely variable in quality, and consequently in carrying capacity. Many of them are located on land good for little else; others are located on the very best of land, and receive careful irrigation. Our data on irrigated pastures for ewes are not as complete as we should like and therefore not as reliable as our figures on winter feed.

As a general rule, an acre of good irrigated land that is capable of producing three tons of alfalfa hay a year will, when seeded down to a good stand of blue-grass or mixed grasses, support approximately five ewes and their lambs per acre. For such land a reasonable rental including irrigation would be $15.00 an acre, or $3.00 per ewe. Better land would have a higher carrying capacity and be worth the higher rental although the amount per ewe would be about the same. Some lands, moreover, will do relatively better in pasture than in alfalfa, while others, especially new lands that are loose and sandy, may do relatively better in alfalfa.

Blue-grass is the pasture most commonly used, but a good mixture practically always makes better feed and carries more stock than blue-grass alone. The Farm Crops department of the Agricultural College will gladly furnish formulas for grass mixtures suitable to any designated locality.

Alfalfa is sometimes used for pasture and will carry more sheep per acre than any other crop, but the danger from bloat is so great that its use is not recommended.

In any case, it will be necessary to subdivide the pasture into at least two parts so as to allow for rotation at the time of irrigation. About three divisions usually proves the best, as this plan allows not only time to irrigate and let the ground dry out, but it allows the pasture time to grow somewhat before the sheep come back to it.

**Pasture for yearling ewes.** Yearling ewes that are to be bred in the fall, but which of course have not produced lambs as yearlings, will require somewhat less pasture than ewes with lambs. In order to get adequate growth, however, the pasture must be good. The pastures

will carry 25 percent more yearlings than breeding ewes; hence the charge would be $2.40 per head instead of $3.00.

**Labor.** On account of the irregularity of the hours, most farmers have practically no idea of the amount of labor which they put on their sheep. About the only data we have on this subject are the records from the Agricultural College, where the labor per ewe through a series of years has amounted to 3½ hours per head per year, or 350 hours for a flock of 100 head. This is for the labor actually necessary in the maintenance of the flock as would be necessary on a commercial farm, and does not include labor of experimental weighings, record keeping, etc. At 40 cents an hour, the labor cost would be $1.40 per ewe per year. The labor cost of taking care of ewe lambs from weaning until ready to go into the breeding herd the following year is about half the labor cost of caring for breeding ewes. We are therefore estimating the cost in this case at 75 cents per head.

**Sheds and equipment.** Very little special equipment is needed. Simple hay racks for winter feeding and the simplest kind of sheds for lambing time are all that is necessary. The only sheep that must have shelter are young, weak lambs. Few sheepmen have investment in sheds and equipment in excess of $200 for 100 sheep, and it is usually less than $100. Twenty square feet of shed room is sufficient for a ewe. This much shed room will take approximately 45 board feet of lumber. If the shed is used only at lambing, it will not be necessary to provide shelter for more than half of the ewes at any one time. If a dipping vat is necessary, this will add some expense, but $25 will take care of this item for a band of 100 head, and a corresponding amount for a larger flock. We have estimated 30 cents per head to cover interest, depreciation, and upkeep on equipment. This is a small allowance and will not provide anything elaborate, but will provide all that is ordinarily necessary. A large, expensive sheep barn usually fails to pay interest on the investment.

**Rams.** An exceptionally early, well-grown ram lamb may be used on a flock of 20 to 25 ewes, but as a rule the use of a ram before he is a yearling is not good practice and most sheepmen will not use a lamb at all. A yearling or two-year old ram may be used on a flock of 50 to 75 ewes, and sometimes used on as many as 100. On the present scale of sheep prices, with lambs bringing 10 cents a pound in the fall, it is hardly possible to get a good yearling ram worth using for less than $25. On the other hand, it is not usually necessary to pay more than $50 for a ram to use on a grade flock, although sometimes rams costing as much as $75 or $100 may be good investments. The Union Experiment Station several years ago paid $100 for a Hampshire ram that proved extraordinarily profitable. To a farmer in the habit of selling lambs at $7 or $8 a head, these prices seem high; but if he will investigate the cost of producing good, pure-bred yearling rams, he will find that these prices are about in line with mutton lambs at 10 cents a pound. The use of scrub or grade rams does not pay even if they cost nothing at all.

To avoid inbreeding, most breeders get a new ram every two years. A ram, however, should be good for at least four years of service; hence the trading of rams is usually necessary.

The cost of ram service for rams of different prices is shown in the table below. In this table the useful life of a ram is taken at four years. At the end of that time his mutton value is taken at $2.50.

| | | | |
|---|---|---|---|
| Cost of yearling ram | $15.00 | $25.00 | $40.00 |
| Annual cost items: | | | |
| Interest on average value at 8 percent | .82 | 1.32 | 1.84 |
| Depreciation | 3.13 | 5.63 | 9.38 |
| Loss by death 8 percent | .82 | 1.32 | 1.84 |
| Labor | 2.00 | 2.00 | 2.00 |
| Pasture | 3.00 | 3.00 | 3.00 |
| Hay 500 lbs. at $8.00 a ton | 2.00 | 2.00 | 2.00 |
| Shearing and marketing wool | .25 | .25 | .25 |
| Taxes | .17 | .17 | .17 |
| Total annual cost per ram | $12.19 | $15.69 | $20.48 |
| Income from 10 lbs. wool at 40c | 4.00 | 4.00 | 4.00 |
| Net annual cost per ram | 8.19 | 11.69 | 16.48 |
| Ram service per ewe: | | | |
| 30 ewes per ram | .27 | .39 | .55 |
| 50 ewes per ram | .16 | .23 | .33 |
| 70 ewes per ram | .12 | .17 | .24 |

**Miscellaneous items.** Among the various miscellaneous items to be considered are shearing and packing of wool, which will amount to about 20 cents a head; taxes, which, taken the state through, average about 17 cents; and salt, which will average about 7 cents. In addition there will be a few miscellaneous items, sheep dip, etc. An allowance of 15 cents a head, or $15.00 for 100 head, will usually be sufficient to take care of these items.

**Summary of maintenance charges.** The total of all maintenance charges previously mentioned for a breeding ewe may be summarized as follows:

| | | |
|---|---|---|
| Feed and pasture: | | |
| 500 lbs. hay at $8.00 a ton | $2.00 | |
| 1/5 acre irrigated pasture at $15 | 3.00 | |
| Total feed and pasture | | $5.00 |
| Labor, 3½ hours at 40c | | 1.40 |
| Housing | | .30 |
| Ram service, one $40 ram for 50 ewes | | .32 |
| Shearing and packing wool | | .20 |
| Taxes | | .17 |
| Salt | | .07 |
| Miscellaneous items | | .15 |
| Total maintenance charges | | $7.61 |

The maintenance charges on growing a ewe lamb from weaning time to breeding time would be as follows:

| | | |
|---|---|---|
| Feed and pasture: | | |
| 400 lbs. hay at $8.00 a ton | $1.60 | |
| Pasture | 2.40 | |
| Total feed and pasture | | $4.00 |
| Labor | | .75 |
| Shearing and packing wool | | .20 |
| Taxes | | .17 |
| Salt | | .07 |
| Miscellaneous | | .15 |
| Total maintenance charges | | $5.34 |

As with ewes, this statement does not include interest, depreciation, and death loss. These factors will be considered in a later paragraph.

## INVESTMENT

**Cost of growing a yearling ewe.** In the long run, the cost of a yearling ewe is the market price of a ewe lamb plus the net cost of keeping her until she is of breeding age (18 months). Therefore, as the first step in our study, we will take a good ewe lamb of black-faced breeding, weighing 80 pounds, worth 10 cents a pound, and see what she will cost us when she is 18 months old and ready to go into the breeding flock. These costs will be as follows:

| | |
|---|---|
| Total maintenance charges as above | $5.34 |
| Original cost of ewe lamb | 8.00 |
| Interest, 8 percent on $8.00 | .64 |
| Probable death loss, 6 percent on $8.00 | .48 |
| Total cost of yearling ewe | $14.46 |
| Income from wool, 7 lbs. at 40c | 2.80 |
| Net cost of yearling ewe | $11.66 |

**Death loss and depreciation on ewes.** Having determined the initial cost of a yearling ewe ready to go into the breeding flock, the next question is the matter of death loss and depreciation. Death loss may be reduced by careful management, but never entirely eliminated. Some ewes will die at lambing time; others will die of accidents of various kinds; and still others will die from reasons unknown. Any sheepman who keeps his average annual death loss below 5 percent is to be congratulated. Many good sheepmen on the ranges have death losses averaging as high as 10 percent, even with good management. Under farm conditions, however, the loss should not be this high, and whenever the loss runs above 7 percent or 8 percent, there is something the matter. If the beginner has fairly good conditions and is willing to give his ewes good care, he would be fairly safe in figuring the death losses at 6 percent. This is for ewes with good teeth. With old ewes with bad teeth or no teeth, the death loss will range from 10 percent up.

Depreciation is something which cannot be avoided. The best yearling ewe will at seven or at the most eight years be a cull, for which the owner will be fortunate to get $4.00 or $5.00; and if he does not sell her soon she will probably die on his hands. There are occasional ewes that are good producers up to ten years or more, but there are others that must be disposed of at three or four, and once in a while a ewe that does not breed at all.

The teeth are the factor that usually determine a ewe's period of usefulness. When her teeth break off or come out, she can not handle her feed properly, will be unable to keep up in flesh, and is apt to die in the first storm. If she lives to produce a lamb, she will probably be unable to care for it properly. If sold she will bring only the value of her pelt. It is, therefore, the custom among sheepmen to cull out all the ewes as soon as their mouths are broken and before they become too decrepit. Ewes that fail to breed, or ewes that have spoiled udders, must also be eliminated. Necessarily some ewes are hardier and give a longer period of service than others, but on the average they are good for approximately six breeding seasons, and in making an investment this is the length of time which we can safely count on, except where the ewes are run in a very sandy country, in which case their teeth wear rapidly and they will probably not be good for an average of more than four or five breeding seasons.

**Value of breeding ewes of different ages.** With the value of a yearling ewe established at $11.66, and assuming that a ewe is good for six breeding seasons and worth $4.00 as a cull, the value on September 1 of ewes of different ages would be as follows:

| | | |
|---|---|---|
| Ewe lamb, 80 lbs. at 10c | $ 8.00 | |
| Yearling ewe ($8.00 plus net cost of maintenance) | 11.66 | |
| Two-year-old ewe | 10.40 | Average of breeding ewes $8.48 |
| Three-year-old ewe | 9.12 | |
| Four-year-old ewe | 7.84 | |
| Five-year-old ewe | 6.56 | |
| Six-year-old ewe | 5.28 | |
| Seven-year-old ewe | 4.00 | |

In this table we have figured on a uniform depreciation of approximately $1.28 a year, which is accurate enough for practical purposes, although if we were to get it down to a very fine point we would have to figure the depreciation on the younger ewes at a little less than this figure, and on the older ewes at a little more. Ewes two to four years of age make the best mothers and raise the best lambs.

The values given in this table are about in line with the present market prices for good ewes, except that the demand of beginners for cheap ewes is making the price of old ewes a little higher than it should be. The demand for breeding ewes has been such as to keep in the breeding flock a great many old culls that should have been sent to the butcher. In any case, however, the conditions are near enough to the table so that we shall use it as the basis of our calculations, and in this bulletin we shall assume the average value of breeding ewes of mixed ages to be the even figure of $8.50.

**Methods of figuring depreciation.** Depreciation may be met in one of two ways. (1) The sheepman may go out each fall and buy enough good yearling ewes to make up for his death loss and for the cull ewes which he must sell. The cost of these yearlings will be a cash expense only partly offset by the income from cull ewes.

(2) The other method is to save out of the lamb crop enough lambs to keep up the ewe flock. In this case no cash need be expended for new ewes, but the annual income will be reduced by the value of the ewe lambs saved, and the annual operating cost will be increased by the cost of maintaining these ewe lambs for a year. The final result should be the same in either case, but the latter method is the surer and better, and if maintained for a few years will enable the owner to build up a flock of ewes that will produce much more and better lambs than the ewes that can be bought on the market.

If the ewes are kept six breeding seasons, the number of ewe lambs that must be retained in order to keep up the flock of 100 ewes of breeding age is as follows:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Annual death loss | 10% | 9% | 8% | 7% | 6% | 5% | 4% |
| Number of ewe lambs to be retained | 24 | 23 | 22 | 21 | 21 | 20 | 19 |

Where the ewes are kept only five breeding seasons, three to four more ewe lambs must be retained. Where the ewes are kept seven breeding seasons (which is seldom advisable), the number of ewes retained may be reduced by about two head. In these figures, allowance is made for probable death loss of the ewe lambs between the time they are weaned and the time they are to be bred, one year later.

**Interest.** In any estimate of cost, a reasonable rate of interest must be allowed on the investment. If it is the owner's own money, he is entitled to as much interest as he could get in some other investment. If borrowed money, he is entitled to the rate of interest which the money costs him. We usually figure that the investment in livestock should return about 8 percent.

## INCOME

**Lambs.** The chief factors producing a large crop of lambs are: (1) prolific ewes; (2) plenty of green feed at breeding time; (3) virile rams; (4) good feed and plenty of exercise during the winter; (5) good weather and good care at lambing time; (6) good milk-producing feed for the ewes while suckling. Some of these items are under the control of the owner; others are to a considerable extent at the mercy of the weather. A combination of dry weather at breeding time and bad storms at lambing makes it difficult for the best sheepman to produce a good lamb crop; while the reverse conditions may give the most careless sheepman satisfactory results. One year with another, we believe that for each 100 ewes in the breeding flock under farm conditions, there should be 100 lambs at marketing time. This would be for the average of a series of years and with ordinary intelligent management. If the crop runs less than this for a number of years, there is probably something wrong with the ewes or with the management.

In normal years with good ewes, good rams and no unusual bad luck the number of lambs should run considerably in excess of one hundred, probably around one hundred and twenty-five. Occasional bad years, however, will lower the average considerably. In spite of all precautions we occasionally get a ram that proves to be a non-breeder. Of course, another ram may be substituted later in the season but at the best the lamb crop will be late and small. A bad attack from dogs during the breeding season is also disastrous to the lamb crop. Even worse is a bad infection of lip and leg ulceration at anywhere around lambing time. These things all pull down the average. A first class sheep man will not be contented with an average of one hundred lambs, but the beginner had better not invest his money on the expectation of more until he has had experience enough to demonstrate what he can actually do.

There are several ways of figuring lambing percentages, but the most common is to figure the number of lambs at marking time as compared with the number of ewes producing lambs. This lambing percentage does not take into account the ewes that die before lambing or the lambs that die between marking time and marketing time. If 100 ewes are to have 100 salable lambs the next summer, the lambing percentage will have to be about 110 percent.

Lambs from good, black-faced rams, and out of large, heavy milking ewes, and run on good irrigated pastures should weigh 80 pounds and be in good condition at an age of 5 to 6 months. If from ewes of poorer breeding, or bred more along wool-producing lines, the lambs will be smaller and many of them not fat.

In this connection, it should be noted that farm-raised lambs that are not fat at marketing time are usually too large and coarse to be good feeders. A small unfinished range lamb makes a good feeder and will often bring almost as much per pound as a fat lamb, but this is not true

of the larger, coarser farm lamb. The loss on unfinished lambs in the farm flock is therefore heavy, and every effort must be taken to get all of the lambs fat. Another difficulty of the farmer-sheepman is that, owing to the small size of his flock, he finds it necessary to market his lambs all in one bunch and can not conveniently divide them up into a number of bunches and market each bunch as they get fat. This makes it all the more important that his flock be uniform and that there be the fewest possible lambs that are under weight and the fewest possible that are over weight. Community shipments, if properly handled, might make it possible for the farmer to sell his lambs a few at a time as they are ready, but ordinarily he will have to sell them all at once and sacrifice a little on those that are over or under weight.

**Wool.** Generally speaking, the wool clip from farm ewes will not run as high as from range ewes. Ewes carrying considerable black-faced blood will produce more and better lambs than ewes carrying more Rambouillet or Lincoln blood, but they will not produce as much wool. Hence if we are to figure on marketing one 80-pound lamb for each ewe bred, we must not figure on too large a wool crop. On the average, about 7 pounds would be a safe estimate for a farm flock bred along mutton lines, but of course this may run higher in some instances and lower in others. If the farmer begins with range-bred ewes, his wool crop may run higher than 7 pounds, but his lamb crop will in all probability be less. Then as he continues to grade up his flock with the use of good mutton rams, his lamb crop will increase in number, size, and quality, but his wool crop may not increase; in fact, it may even decrease. In spite of the difference in wool, however, a flock well bred along mutton lines will normally prove much more profitable under farm conditions than a Rambouillet or Merino flock. A small percentage of Rambouillet or Merino blood in the ewes, however, will be more beneficial than harmful.

**Cull ewes.** The income received from the sale of cull ewes is not a large item, but it helps. It is important, however, that cull ewes be eliminated from the band before they become too thin and decrepit and while they can still be sold at a fair price. Any ewe that fails to breed for two seasons should be disposed of. Where lambs are worth 10 cents a pound in the fall, $4.00 should be a fair price for cull ewes. Cull ewes are usually sold in the fall at a time when the sheep market is not very good, but on account of the high cost of holding them over until spring it is usually better to sell in the fall or late summer and stop the expense bill.

## PROFIT AND LOSS

**Total cost and income.** Having studied the various items of cost and income, we are now ready to total them up and see where we stand. At the outset, however, we must realize that neither the cost nor the income from a bunch of ewes is ever twice the same. Nature refuses to be fit into a standard mold. Yet with all her variations, she continually comes back to a fairly well-established average. The budgets submitted are based upon such averages, and may be considered as a fairly safe guide for investment, realizing all the time that the actual results for any one

year may vary a great deal from the budget given. Good or bad management may also change the results, and change them very materially.

Since there are two ways of keeping up the ewe flock, one by buying yearling ewes and the other by keeping over ewe lambs, we are giving budgets for the two methods.

**A. Ewe flock maintained by buying yearlings.**

| | | |
|---|---|---|
| Expenses per 100 ewes: | | |
| Feed and pasture: | | |
| 25 tons hay at $8.00 per ton | $200.00 | |
| 20 acres irrigated pasture at $15.00 | 300.00 | |
| Total feed and pasture | | $500.00 |
| Labor, 3½ hours at 40c | | 140.00 |
| Ram service, $40 ram for 50 ewes | | 32.00 |
| Shearing, packing, and marketing wool | | 20.00 |
| Taxes | | 17.00 |
| Salt | | 7.00 |
| Housing and equipment | | 30.00 |
| Miscellaneous (dip, etc.) | | 15.00 |
| Interest, 8 percent of $850.00 | | 68.00 |
| 20 yearling ewes to replenish the flock at $11.65* | | 233.20 |
| Total expenses | | $1062.20 |
| Income per 100 ewes: | | |
| 100 lambs, 80 lbs. at 10c | $800.00 | |
| 700 lbs. wool at 40c | 280.00 | |
| 14 cull ewes at $4.00 | 56.00 | |
| Total income | | 1136.00 |
| Balance | | $ 73.80 |

**B. Ewe flock maintained by holding over ewe lambs.**

| | | |
|---|---|---|
| Expenses per 100 ewes and 21 yearlings: | | |
| Feed and pasture for ewes: | | |
| 25 tons hay at $8.00 a ton | $200.00 | |
| 20 acres irrigated pasture at $15 | 300.00 | |
| Total feed and pasture | | $500.00 |
| Labor, 3½ hours at 40c | | 140.00 |
| Ram service $40 ram for 50 ewes | | 32.00 |
| Shearing, packing, and marketing wool | | 20.00 |
| Taxes | | 17.00 |
| Salt | | 7.00 |
| Housing | | 30.00 |
| Miscellaneous (dip, etc.) | | 15.00 |
| Interest, 8 percent of $850.00 | | 68.00 |
| Maintenance of 21 yearlings* held for breeding purposes at $5.98 per head, as shown in budget for growing a yearling ewe | | 125.58 |
| Total cost for entire flock | | $954.58 |
| Income per 100 ewes: | | |
| Mutton: 21 ewe lambs not sold. No income. | | |
| 79 lambs sold, 80 lbs. at 10c | $632.00 | |
| 14 cull ewes sold at $4.00 | 56.00 | |
| Wool: 100 ewe fleeces, 7 lbs. at 40c | 280.00 | |
| 21 lamb fleeces, 7 lbs. at 40c | 58.80 | |
| Total income | | 1026.80 |
| Balance | | $ 72.22 |

*These are to replace six dead ewes and the fourteen culls sold. This is figured on the basis of an annual death loss of 6 percent and of ewes kept for six breeding seasons. Yearlings are charged at cost of production as shown elsewhere.

*These are to replace six dead ewes and the fourteen culls sold, also one extra ewe lamb is provided to allow for probable death loss before they reach breeding age. This takes care of death loss and depreciation where the annual death loss is 6 percent and the ewes are kept for six breeding seasons.

**Profit.** Financially, the budgets given mean that a farm flock should return to the owner $8.00 a ton for the hay, $12.00 an acre rent on the pasture, 8 percent on investment, 40 cents an hour for the labor, and 72 cents a head additional. If he owns the ewes outright, grows his own hay, owns his own pasture, and does his own labor, all of these various items mentioned will come into his own pocket. On the other hand, if he borrows the money to buy the ewes, buys the hay, rents the pasture, and hires the labor, all that will be coming to him will be the 72 cents a head, and the probabilities are that under these circumstances his management will not be very good and he will not even get the 72 cents.

**Possibilities for extra profit.** There are always possibilities for a larger profit than is indicated in the budgets. Exceptional care may lower the death losses; extra good feed may produce a larger and more salable lamb; extra care at breeding and lambing time may produce a higher percentage of lambs. More care in culling the ewes to make sure that the old ewes are sold before the teeth are too badly gone and before they reach the stage where it is impossible to fatten them, may bring in a little more money from that source. The big possibility, however, is by breeding up a flock of ewes that will produce more and better lambs than the average. As an example of possibilities of an exceptional flock, we mention our flock at Union. For seven years we have had an average of better than 130 lambs at marketing time for each 100 ewes bred the fall before. At the same time, the ewes have averaged approximately 8 pounds of wool. We started with a bunch of old range ewes. They were fair ewes having a little Rambouillet blood and some black-faced blood. Apparently they were out of ewes of mixed breeding and sired by grade Hampshire bucks. We have used on these ewes nothing but pure-bred Hampshire bucks, with the result that the present flock contains a high percentage of Hampshire blood and many would pass for good pure breds. These ewes have not had any undue expense lavished on them. The exceptional results are apparently due to four points: (1) care exercised in the selection of the ram; (2) care exercised in the selection of the best ewe lambs for breeding purposes; (3) care in the elimination of the unprofitable ewes; (4) flushing the ewes at breeding time; and (5) careful attention to avoid losses at lambing time. The unusual thing in the management of this flock is not the care and attention they have received at any particular time, but rather that they have received the same care and attention year in and year out. We have done nothing that any farmer can not do, although it is not highly probable that very many will do it. The usual policy is that when the sheep business is good we buy all the ewes we can get regardless of quality. Then when business is bad we sell out everything. Of course, a high producing ewe flock can never be built up in that way. The profits from our flock at Union are therefore not due solely to the care and management of the current year, but to the cumulative results of several years' work along the same line. The drastic culling we gave our ewes six and seven years ago and the good rams we used then are still adding to our profits.

**Possibilities for loss.** The possibilities for loss in farm sheep production are many. Among them may be enumerated the following: (1) The purchase of unprofitable ewes that do not and can not produce a

satisfactory crop of lambs. (2) The use of inferior bucks. (3) Failure to eliminate the shy breeding, unprofitable ewes. (4) Failure to give adequate hay in winter time. (5) Carelessness at lambing time. (6) Failure to dock and castrate the lambs. (7) The attempt to grow the lambs on dry or scanty pastures or to use them as scavengers. (8) High death losses due to the many little things that happen to a flock that is not closely watched. (9) Selling out the first time the price goes down.

Most of the sources of loss come under the general head of carelessness and bad management, which theoretically can always be avoided. In actual practice there are only a small percentage of our farmers who are willing to give a band of sheep the necessary attention. Those who are unwilling to give them the care and attention which they need had far better let them alone. It is a common assumption among those who have not given the matter careful attention that farm sheep are better cared for than range sheep; but this, on the average, is quite contrary to fact. The general run of farm sheep are poorly cared for and poorly managed, and while some of the lambs are of exceptional quality the general run are of a low grade. The lambs that come out of the Corn Belt to the Chicago market do not average as good as those that come off the ranges. Likewise, the lambs that come out of the Willamette Valley to the Portland market do not average as good as those that come from the ranges. On the other hand, the best lambs from the farms are better than the best lambs from the ranges.

The budgets in this circular are prepared on the assumption that the management will be such as a man of average intelligence may give if he is really serious in his purpose and does the best he can. It is not assumed that he is an experienced expert. On the contrary, this circular is written specifically for the beginner.

**Buying ewes.** The ewe to buy is the strong, healthy ewe with a straight, broad back, a sound udder, sound teeth, and heavy fleece of reasonable fineness. If she has these qualities the feed will not matter. Such a ewe when bred to a good Shropshire or Hampshire ram may be depended upon to produce a good lamb. Ewes four to six years old produce the best lambs and are easier to handle, but they are not worth as much money as yearlings because they are too near the end of their usefulness.

Farmers often buy broken-mouthed range ewes that are too old to be used on the range any longer. On chopped hay, grain, and plenty of rich green pasture, these old ewes may be made to produce one or two more fair lamb crops, but the feed cost is higher than for younger ewes, the lamb crop less, and the death loss greater. This plan has been tried extensively both in the West and in the Corn Belt, but has not been successful except on a rising market such as we have had for the past few years. We do not recommend the practice. On the contrary, we recommend that the farmer-sheepman buy a small bunch of good ewes, save his best ewe lambs, and build up a permanent flock of carefully selected, high producing ewes.

**Market conditions and prospects.** The present market for both lambs and wool is of course quite satisfactory. Lambs and wool are about the only agricultural products that are selling for more than non-agricultural products.

The purchasing power of wool is today very much higher than it has averaged for the past thirty years. A pound of wool in 1924 would buy 63 percent more than it would in 1913. These facts would lead us to consider the present market for lambs and wool as not only good but higher than we can normally expect. The demand for ewes at the present time is very keen, in part due to favorable conditions in the sheep industry, and partly due to unfavorable conditions in the cattle industry.

In any case, the prospective sheepman must recognize the fact that there will come times when the price of both mutton and wool will be discouragingly low. There will be years when the business even at the best management will be conducted at a loss and the temptation will be strong to close out. On the other hand, there will be years like the present (1925) when the profit will be unusually high and the temptation will be strong to go in debt for a lot of high priced stuff. It is our judgment that on a farm that can produce an abundance of good hay and pasture at a reasonably cheap figure and where the owner is willing to give his sheep rather careful attention, a farm flock will return a good profit when taken through any long period of time. Where, however, the cost of either hay or grass is unusually high, and where the owner is unwilling to give his flock careful attention, the sheep business should be left severely alone. There will be many flocks established on irrigated farms during the present "boom" that will not be permanent and that eventually will be sold out at a loss. Nevertheless, we believe that farm flocks have a permanent place on much of our irrigated lands, and in spite of booms and depressions a flock established on a suitable farm and in capable hands will in the long run be a most satisfactory investment.

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